



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,863	02/07/2001	Alexander Mark Franz	0026-0008	4022
26615	7590	05/02/2005	EXAMINER	
HARRITY & SNYDER, LLP 11240 WAPLES MILL ROAD SUITE 300 FAIRFAX, VA 22030			LERNER, MARTIN	
			ART UNIT	PAPER NUMBER
			2654	

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/777,863

Applicant(s)

FRANZ ET AL.

Examiner

Martin Lerner

Art Unit

2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 to 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20 to 24 is/are allowed.
- 6) ☒ Claim(s) 1 to 4 and 8 to 19 is/are rejected.
- 7) ☒ Claim(s) 5 to 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 8, 10 to 12, and 17 to 19 are rejected under 35 U.S.C. 102(e) as being anticipated by *Weber* ('524).

Regarding independent claims 1, 17, and 18, *Weber* ('524) discloses a method, system, and computer-readable instructions, comprising:

“means for receiving the voice search query from the user” – microphone 110 captures one or more spoken words (column 7, lines 8 to 9; Figures 1 and 3A: Step 300); the system comprises a speech processor for searching grammar files and a natural language processor for searching a database for a matching entry (column 2, lines 58 to 67); generally, the method and system provides for searching databases for information about news, stocks, weather, movies, and web pages (column 11, line 50 to column 13, line 59);

“means for deriving one or more recognition hypotheses from the voice search query” – grammars are searched for a matching word or phrase of the utterance

Art Unit: 2654

(column 7, lines 31 to column 8, line 10: Figure 3A: Steps 304, 310, and 316); the natural language processor database 218 is searched for possible matches to the phrase, based on whether the NLP database 218 contains any of the words in the phrase (or their synonyms), and the relative weights of those words (column 10, lines 45 to 49: Figures 2 and 3B: Step 336);

“means for associating a weight with each of the recognition hypotheses” – individual words in the phrase are weighted according to their relative importance or significance to the overall meaning of the phrase by word weighter 208 (column 10, lines 17 to 30: Figures 2 and 3B: Step 334); a confidence weight is generated for each of the possible matching entries based on the number of occurrences of each of the words in the phrase and their relative weights (column 10, lines 49 to 61: Figure 3B: Step 338);

“means for construction a weighted boolean query using the recognition hypotheses” – boolean tester 210 performs a boolean “AND” test to determine whether each one of the non-noise words in the phrase (or its synonym) is actually present in the highest-confidence entry (column 11, lines 39 to 49: Figure 3B: Step 348); a confidence weight is generated for each of the possible matching entries based on the number of occurrences of each of the words in the phrase and their relative weights; weighted word searching of a database is well known in the art (column 10, lines 49 to 61: Figure 3B: Step 338); weighting factors are assigned to individual words in a phrase according to their relative “importance” or “significance”; a lowest weighting factor is assigned to words such as “a”, “an”, “the” and other articles; verbs, nouns, adjectives, and proper

Art Unit: 2654

names are likely to have a significant relation to the meaning of the phrase, and are given the highest weighting (column 10, lines 17 to 30);

“means for providing the weighted Boolean query to a search system” – searching of the databases for information about news, stocks, weather, movies, and web pages is performed by boolean “AND” search logic for each of the words in the phrase (or its synonym) (Figure 4);

“means for obtaining results from the search system” – for the highest-confidence entry, an associated action is performed; for example, if the highest-confidence entry is “show me the news”, the associated action may be to access a predetermined news web site on the Internet (column 11, lines 50 to 67: Figure 3C: Step 350).

Regarding independent claim 19, *Weber* ('524) further discloses a central processing unit 102 for performing the method for searching databases (column 5, lines 20 to 33: Figure 1), and storage medium 108 for storing speech recognition processor 220, natural language processor 202, grammar files 212, 214, 216, 217, and natural language processor database 218 (“a language model”); “a server” is only preambularly recited in the claim, and is not entitled to patentable weight.

Regarding claim 2, *Weber* ('524) discloses speech recognition processor 220, natural language processor 202, grammar files 212, 214, 216, 217, and natural language processor database 218 (“a language model”) are searched for matching words or phrases to interpret the utterance (column 7, line 14 to column 8, line 10).

Regarding claim 8, *Weber* ('524) discloses a procedure for discarding "noise" words for retrieving the highest-confidence entry that does not contribute significantly to the overall meaning of the phrase (column 11, lines 11 to 30: Figures 3B and 3C: Steps 344, 346, and 348); weighting factors are assigned to individual words in a phrase according to their relative "importance" or "significance"; a lowest weighting factor is assigned to words such as "a", "an", "the" and other articles; verbs, nouns, adjectives, and proper names are likely to have a significant relation to the meaning of the phrase, and are given the highest weighting (column 10, lines 17 to 30); thus, weighting individual words in a phrase according to their importance is equivalent to "adjusting a ranking of the results of the search system based on the weights."

Regarding claim 10, *Weber* ('524) discloses the natural language processor 202 determines whether any of the possible matching entries has a confidence value greater than or equal to some predetermined minimum threshold, T; if there is no possible matching entry with a confidence value greater than or equal to T, then an optional error message is displayed (column 10, line 62 to column 11, line 10: Figure 3B: Steps 340 and 342); thresholding is performed prior to a final search with discarded "noise" words from a phrase ("prior to constructing the weighted boolean query") (Figures 3B and 3C: Steps 344, 346, 348); implicitly, if there are no matching entries with a confidence value greater than or equal to T, the search is discarded.

Regarding claim 11, *Weber* ('524) discloses boolean tester 210 performs a boolean "AND" test to determine whether each one of the non-noise words in the phrase (or its synonym) is actually present in the highest-confidence entry (column 11,

Art Unit: 2654

lines 39 to 49: Figure 3B: Step 348); because synonyms are alternatives to each of the words in the phrase being searched, using synonyms in a search query is equivalent to an "OR-query".

Regarding claim 12, *Weber* ('524) discloses a procedure for discarding "noise" words for retrieving the highest-confidence entry that does not contribute significantly to the overall meaning of the phrase (column 11, lines 11 to 30: Figures 3B and 3C: Steps 344, 346, and 348); after an initial search, a highest-confidence entry is determined (column 10, line 62 to column 11, line 11: Figure 3B: Steps 338 and 340); thus, providing a highest-confidence entry after discarding "noise" words is equivalent to "refining the weighted boolean search based on the results of the search system."

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 4, 9, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Weber* ('524) in view of *Mahajan et al.*

Concerning claim 3, *Weber* ('524) does not expressly disclose updating a language model, phonetic dictionary, or acoustic model using the voice search query, although it is common in the art to adapt or update models in speech recognition. However, *Mahajan et al.* teaches information retrieval and speech recognition based on

Art Unit: 2654

language models, wherein the language model 70 is adapted on-the-fly after the query has been executed against a relevancy measure for each of the documents. (Column 9, Line 40 to Column 10, Line 11: Figure 3: Steps 94, 96, and 98) *Mahajan et al.*

suggests that adapting a language model has the advantage of improving the accuracy and speed of the recognition process. (Column 3, Lines 16 to 28) It would have been obvious to one having ordinary skill in the art to update a language model as suggested by *Mahajan et al.* in the speech recognition and natural language interactive user interface of *Weber* ('524) for the purpose of improving the accuracy and speed of the recognition process.

Concerning claim 4, *Weber* ('524) discloses identifying context-specific grammars 212 ("a language model"), and using the identified language model to derive recognition hypotheses. (Column 7, Lines 14 to 45; Column 8, Lines 11 to 38: Figure 3A: Steps 302, 304, and 306) The only element not expressly disclosed by *Weber* ('524) is a language model based on "at least one characteristic associated with the user". However, a context-specific grammar may be based on a subject commonly accessed by the user. *Mahajan et al.* teaches information retrieval and speech recognition based on language models, wherein topic dependent language models can be retrieved based on input by the user as to the subject. (Column 7, Lines 32 to 38) Moreover, if a user may tend to dictate more formal documents, the system can be configured to generate documents with a language model adapted to formal documents. (Column 10, Lines 12 to 66) It would have been obvious to one having ordinary skill in the art to identify a language model to derive recognition hypotheses based on a

characteristic associated with the user as suggested by *Mahajan et al.* in the speech recognition and natural language interactive user interface of *Weber ('524)* for the purpose of improving the accuracy and speed of the recognition process.

Concerning claim 9, *Weber ('524)* discloses providing a highest-confidence entry based on a weighted search query, but does not expressly disclose organizing the results based on the weights. However, those skilled in the art know it is common to organize search results by relevancy to assist the user in more readily identifying a desired document. *Mahajan et al.* teaches information retrieval and speech recognition based on language models, wherein the system determines a relevancy measure of each document, and ranks the documents according to relevancy. (Column 14, Lines 27 to 44: Figure 4: Step 118) It would have been obvious to one having ordinary skill in the art to organize documents retrieved from a search by relevancy as suggested by *Mahajan et al.* in the speech recognition and natural language interactive user interface of *Weber ('524)* for the purpose of assisting the user to more readily identify a desired document.

Concerning claims 13 and 14, *Mahajan et al.* teaches adapting a language model based on the information retrieved as a result of the executed query. (Column 8, Lines 16 to 53) *Weber ('524)* discloses that phrases having no matching entry with a confidence value greater than a threshold have zero hits, and produce an error message. (Column 11, Lines 1 to 10) Thus, these search results are discarded. Adapting a language model involves adjusting weights of a language model in accordance with the number of times a term is used to improve performance of the

Art Unit: 2654

language model. Thus, adapting a language model begins by determining a number of times a word or phrase of a language model is used. Implicitly, if a word or phrase is not used at all, then a zero, or near zero, weighting is applied. If a word or phrase is used, then adaptation involves adjusting the weight of the word or phrase in the language model in accordance with the number of times the word or phrase is used.

5. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Weber* ('524) in view of *Padmanabhan et al.*

Weber ('524) discloses refining a search query based on eliminating "noise" words, but does not expressly disclose detecting compound words in recognition hypotheses, constructing the weighted boolean queries with detected compounds, and refining the weighted Boolean query based on detected compounds to provide new search results. However, *Padmanabhan et al.* teaches a method and apparatus for forming compound words in speech recognition, wherein a compound word formation module changes acoustic and/or language model vocabularies to improve speech recognition performance. (Column 5, Lines 56 to 61) After the training corpus, language model, and acoustic vocabulary have been augmented with compound words, the hypothesis search module may perform improved recognition with the augmented language model and augmented acoustic vocabulary. (Column 10, Lines 5 to 15) It would have been obvious to one having ordinary skill in the art to augment a language model and acoustic vocabulary with compound words as taught by *Padmanabhan et al.*

Art Unit: 2654

in the weighted speech recognition and natural language interactive user interface of *Weber* ('524) for the purpose of improving recognition performance.

Response to Arguments

6. Applicants' arguments filed 21 January 2005 have been fully considered but they are not persuasive.

Firstly, Applicants argue that *Weber* ('524) does not disclose or suggest constructing a weighted boolean query using the recognition hypotheses. Applicants cite *Weber* ('524) at Column 11, Lines 39 to 49 and Column 10, Lines 49 to 61, but maintain that *Weber* ('524) does not disclose constructing a weighted boolean query using the recognition hypotheses. This argument is traversed.

Weber ('524) does disclose constructing a weighted boolean query using at least one recognition hypothesis. (It should be noted that independent claims 1 and 17 to 19 only positively require one recognition hypothesis, as the claims are limited to "deriving one or more recognition hypotheses" or "at least one recognition hypothesis".) Column 11, Lines 39 to 49 is cited to show that *Weber* ('524) searches a natural language processing (NPL) database with boolean logic. Specifically, *Weber* ('524) provides a boolean "AND" test, which presumes all the words in a natural language query are "AND"-ed together to produce a search result. However, *Weber* ('524) also excludes certain words entirely from a constructed boolean query and provides various weightings for other words according to their significance. *Weber* ('524) says that only non-noise words are included in a boolean "AND" test of a query. Noise words are said

Art Unit: 2654

to include articles, pronouns, conjunctions, and words of a similar nature, which are discarded from a search phrase. (Column 11, Lines 11 to 23) Further, weighting factors are assigned to individual words in a phrase according to their relative "importance" or "significance". A lowest weighting factor is assigned to words such as "a", "an", "the" and other articles. Verbs, nouns, adjectives, and proper names are likely to have a significant relation to the meaning of the phrase, and are given the highest weighting. (Column 10, Lines 17 to 30) Applicants cite *Weber* ('524) at Column 10, Lines 49 to 61, where it is noted that weighted word searching is well known in the art. Apparently, Applicants have overlooked Column 10, Lines 17 to 30 and Column 10, Lines 45 to 49 of *Weber* ('524), where a procedure for weighted word searching is expressly detailed. Thus, *Weber* ('524) discloses constructing weighted boolean queries.

Secondly, Applicants argue that *Weber* ('524) does not disclose or suggest searching databases for news, stocks, weather, movies, or web pages. This position is traversed.

Weber ('524) discloses a natural language processing (NPL) database for providing information about news, stocks, weather, movies, and web sites. A user speaks a natural language phrase "show me the news", and a database is searched to display images associated with the news by accessing a news web site. (Column 11, Lines 50 to 67: Figure 4) A user asks a natural language phrase "how much is IBM stock selling for today", and an NPL database accesses a stock price web site. (Column 12, Lines 15 to 50: Figure 4) Similarly, a user can ask a natural language

question about movies or weather, whereupon actions direct a user to movie or weather web sites. (Figure 4) Thus, *Weber* ('524) discloses searching databases for news, stocks, weather, movies, and web pages.

Thirdly, Applicants argue that *Weber* ('524) does not disclose or suggest adjusting a ranking of possible matching entries, as claimed in claim 8. This position is traversed.

Weber ('524) discloses assigning weights to search terms in a search query, so it must follow that rankings of search results are adjusted as weights are applied. Weighting factors are assigned to individual words in a phrase according to their relative "importance" or "significance". A lowest weighting factor is assigned to words such as "a", "an", "the" and other articles. Verbs, nouns, adjectives, and proper names are likely to have a significant relation to the meaning of the phrase, and are given the highest weighting. (Column 10, Lines 17 to 30) A ranking of search results where search terms are weighted according to a significance of individual words provides a different ranking than if there were no weighting of individual words according to a significance. Thus, assigning weights to individual words in a search phrase adjusts a ranking of search results.

Finally, Applicants argue that *Mahajan et al.* does not disclose or suggest the limitations of claims 13 and 14, directed to determining a quantity of results relating to each recognition hypothesis, and then either discarding the recognition hypothesis having no results or adjusting a weight of results based on the quantity. This position is traversed.

Mahajan et al. suggests adapting a language model, a procedure that meets the limitations of claims 13 and 14, as broadly construed. Adapting a language model involves adjusting weights of a language model in accordance with the number of times a term is used to improve performance of the language model. Thus, adapting a language model begins by determining a number of times a word or phrase of a language model is used. This is equivalent to "determining a quantity of results related to each recognition hypothesis." Implicitly, if a word or phrase is not used at all, then a zero, or near zero, weighting is applied. A zero weighting is equivalent to "discarding recognition hypotheses having no results." If a word or phrase is used, then adaptation involves adjusting the weight of the word or phrase in the language model in accordance with the number of times the word or phrase is used. Adjusting a weighting of a word or phrase in a language model according to the number of times it is used is equivalent to "adjusting the weight associated with the recognition hypothesis based on the quantity." Compare Applicants' Specification, ¶s [0074] - [0075]. Thus, adaptation provides correct hypotheses are given greater weights in accordance with the number of times that a particular hypothesis is correctly recognized.

Therefore, the rejections of claims 1, 2, 8, 10 to 12, and 17 to 19 under 35 U.S.C. 102(e) as being anticipated by *Weber* ('524), of claims 3, 4, 9, 13, and 14 under 35 U.S.C. 103(a) as being unpatentable over *Weber* ('524) in view of *Mahajan et al.*, and of claims 15 and 16 under 35 U.S.C. 103(a) as being unpatentable over *Weber* ('524) in view of *Padmanabhan et al.*, are proper.

Allowable Subject Matter

7. Claims 20 to 24 are allowed.
8. Claims 5 to 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

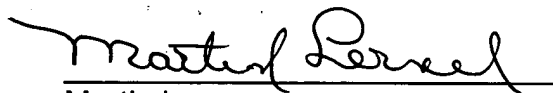
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

Art Unit: 2654

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ML
4/27/05


Martin Lerner
Examiner
Group Art Unit 2654